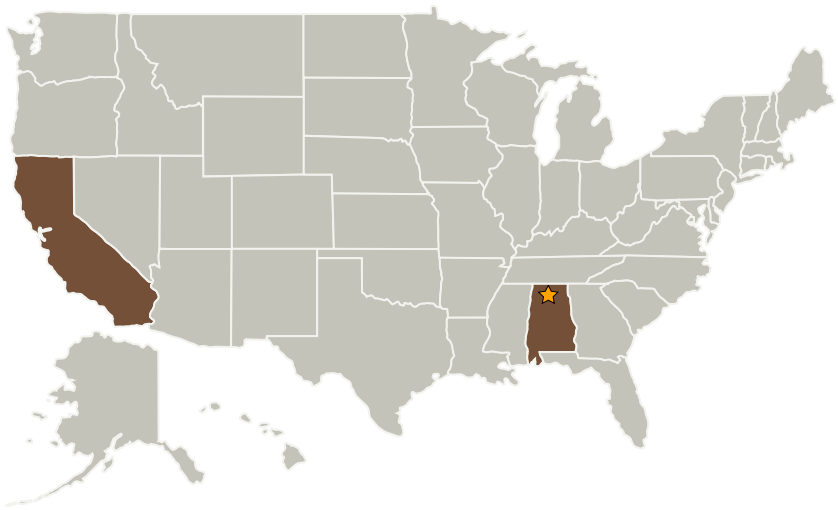
Loaded Gelled Bipropellants for Optimized Performance, Phase I

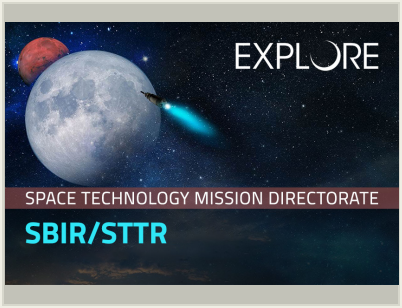
Completed Technology Project (2004 - 2004)

Project Introduction

This proposal is responsive to NASA 2003 SBIR Topic E2.05, ?On-Board Propulsion," addressing Thruster Technology and in particular "Suitability of propellant gellation to enhance operability and performance of in-space propulsion operations." EERGC Corporation proposes to address the solicitation objective in cooperation with subcontractor Northrop Grumman Space and Technology (NGST) Propulsion Systems (formerly TRW Space and Electronics Propulsions Systems Center), the leader in gel propellant technology. The innovation is the development of formulations (and development methodologies) for optimizing high-performance particulate-loaded bipropellant gels to maximize specific thrust, taking into account not only composition but the effect of particle size on maximum loading and on combustion performance. The approach is an innovation as it quantifies the maximum attainable loading for given particle size, and the subsequent tradeoff with impacts on combustion efficiency due to incomplete solid phase burnout if particles are large. The method also allows the physical properties of the gel to be optimized. The project is relevant as it improves the competitiveness of gelled bipropellants with equivalent liquids, while incorporating the safety and handling advantages of gels. The proposed program takes gel technology beyond that developed by EERGC under prior and ongoing DoD programs.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Energy and Environmental Research Corp	Supporting Organization	Industry	Irvine, California

Primary U.S. Work Locations	
Alabama	California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Mark Sheldon

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.6 Gels